

## CURRENT MODE PHASE DETECTION

### Abstract of the Disclosure

The invention relates to phase detectors that integrate a portion of a transition between adjacent or consecutive bits of a serial bitstream in a relatively fixed window by switching currents as opposed to voltages. The phase detector can be used to  
5 synchronize a VCO clock in a PLL to a fast data bitstream used in an optical network, such as SONET. Advantageously, embodiments of a current mode phase detector switch currents, rather than voltages, to integrate the window of the serial bitstream. The current switching allows devices to operate at frequencies approaching the device's  
10  $f_T$  and can advantageously extend the phase detector's bandwidth and allow an associated transceiver to operate at higher data rates. By contrast, the conventional switching of voltage results in a delay induced by the charging of related capacitances, such as parasitic substrate capacitances, which in turn results in actual performance far below the  $f_T$  of the devices.